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Expediting Enforcement of Willful and Repeated Violations of Part 15 By Radar Detectors Operating in the Ku and Ka Bands

Presentation to the FCC Enforcement Bureau

Review of Part 15 and Other Parts of the Commission's Rules, ET Docket 01-178

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SUMMARY

- The record of ET 01-278 and preliminary equipment testing by the FCC's Laboratory unambiguously demonstrate that many models of unlicensed radar detectors are causing harmful interference to licensed VSAT interference in the Ka and Ku bands.
- The Commission has authority, under Sections 151, 154(i), 301, 302(b), 333 and 510 of the Communications Act, as well as established precedent, to take enforcement action against the manufacturers and distributors of the offending devices in interstate commerce to curtail further rule violations.
- The public interest would best be served if the Commission refers these existing rule violations to the Enforcement Bureau for expedited disposition, and proceeds in ET 01-278 to consider those rule changes needed to govern prospective unlicensed operations above 960 MHz.

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Who We Are

- Spacenet, Inc.

http://www.spacenet.com/

Through licensed VSAT network, provides national broadband technology platform.

Customers depend on Spacenet for reliable management of key operations on national and/or regional basis.

Spacenet is important part of nation's communications critical infrastructure, and provides broadband services to manage other critical infrastructure sectors.

- StarBand Communications, Inc.

http://www.starband.com/

America's first two-way, always-on high-speed satellite Internet service provider.

Completion of 1st year of operations=40,000 subscribers in 50 states.

Download speeds up to 500 kbps (targeted minimum speeds in excess of 150 kbps)

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Harmful Interference To Spacenet

- BASED SOLELY ON SPACENET'S VSAT HARDWARE, A VSAT WOULD EXPERIENCE A SERVICE OUTAGE ON THE AVERAGE OF ONCE EVERY 11 YEARS.
- IN 8/2000, IT WAS NOTED THAT 4 SITES IN THE CLEVELAND, OH AREA HAD MULTIPLE VSAT OUTAGES EACH MONTH FOR THE PAST SEVERAL MONTHS.
- CHRONIC SITES ARE THOSE WITH MORE THAN TWO OUTAGES IN ANY GIVEN MONTH. HAVE BEEN IDENTIFIED IN TX, MN, ND, SC, OH, NE, AND CONTINUE TO BE IDENTIFED IN OTHER STATES.
- CAUSE OF ALL THESE OUTAGES WAS INTERMITTENT FAILURE OF VSAT TO MAINTAIN LOCK ON DOWNLINK CARRIER TRANSMITTED BY THE VSAT HUB.
- AFFECTED CUSTOMERS IN CLEVELAND LOST ALL THEIR DATA COMMUNICATION SERVICES EACH TIME THEIR VSATS LOST LOCK ON DOWNLINK CARRIER.
- SERVICE INTERRUPTIONS RANGED FROM A FEW SECONDS TO SEVERAL MINUTES. IN MOST CASES, VSATS REACQUIRE LOCK WHEN INTERFERENCE SUBSIDES. IN SOME CASES, INTERFERENCE CAUSED OUTAGE OF SEVERAL HOURS. MAINTENANCE TECHNICIAN DISPATCHED TO REBOOT THE VSAT.

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Spacenet's Response to Harmful Interference

- SPACENET ENGINEERS STUDIED AND ELIMINATED FIXED EMITTERS.
- RETAINED COMSEARCH, TO MONITOR RF SPECTRUM IN CLEVELAND AREA, PERFORM MEASUREMENTS AND COLLECT DATA. COMSEARCH STUDY CONFIRMED UNLICENSED RADAR DETECTORS IS SOURCE OF HARMFUL INTERFERENCE.
- FOLLOWED UP WITH INTERNAL TESTING OF 9 DIFFERENT BRANDS/MODELS OF RADAR DETECTORS, CONFIRMING INTERFERNCE.
- PROFILE OF VSAT /RADAR DETECTOR INTERFERENCE
  - TIME OF DAY OUTAGES OCCUR (RUSH HOUR/ LUNCH TIME)
  - LENGTH OF OUTAGE (FEW SECONDS TO FEW MINUTES)
  - RECOVERS ON ITS OWN OR NEEDS REBOOT
  - VSAT INDICATES LOSS OF COMMUNICATIOPN LINK WITH HUB INDICATORS
  - NETWORK MANAGEMENT SYSTEM VSAT ALARM ACTIVATED AT HUB NETWORK MANAGEMENT SYSTEM

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Implications for Spacenet

• RESEARCH OF NETWORK MANAGEMENT SYSTEM LOGS AND TROUBLE TICKET DATABASE SHOW RADAR DETECTOR INTERFERENCE IS WIDE-SPREAD AND GROWING.

• MEASURES TO ABATE INTERFERENCE, SUCH AS SCREENING OF INDIVIDUAL VSAT SITES, PROVED INEFFECTIVE, EXPENSIVE AND RAISED LOCAL ZONING CONCERNS.

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RF SHIELD

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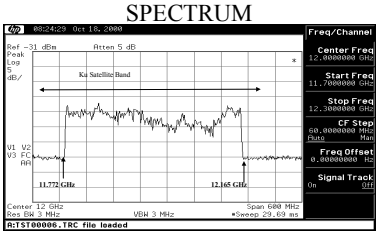
RADAR DETECTOR SCANNED SPECTRUM



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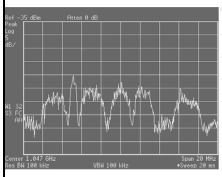
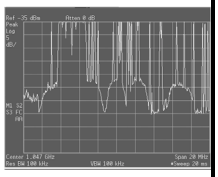
TYPICAL INTERFERENCE DIAGRAM

DOWNLINKS WITHOUT INTERFERENCE



DOWNLINKS WITH RADAR DETECTOR INTERFERENCE



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Initial Test Report From FCC Laboratory

All units which I tested use a form of swept emission, some, or all of which, fall within the frequency band of concern (11.7 - 12.2 GHz). Emission levels were not constant across the swept frequency band. Hence, where feasible, the highest emission outside, and the highest emission within, the band of concern is listed. Emission frequencies and the levels from each of the devices tested are listed below.

Summary of FCC Lab data

Sample No.	Make/ Model	Emission Frequency (GHz)	Emission Level (uV/M)	Emission Frequency Band (GHz)	Exceeds 15.109(a) by:
1.	Escort	11.42	30,549	11.40 - 11.78	35.7 dB
"	Passport 7500	11.77	33,113		36.4 dB
2.	Bel-Tronics Co.	11.59	33,497	10.87 - 11.99	36.5 dB
"	Express	11.73	36,728		37.3 dB
3.	Phantom II	11.47	346,737	11.46 - 11.82	56.8 dB
"		11.71	231,739		53.3 dB
4.	Cobra	11.77	88,105	11.77 - 12.17	44.9 dB
"	ESD-9100	12.07	63,826		42.1 dB

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FCC Laboratory Follow-up Test Report

This is a follow-up to my report dated February 5, 2001, which detailed the measurement results of receiver Local Oscillator (L.O.) emission levels of four (4) sample automobile speed RADAR detectors. Three (3) additional samples were submitted by the original complainant, Spacenet, Inc., for our evaluation. As in the original report, the emission frequencies and levels from each of the three additional devices tested are listed below:

Sample No.	Make/ Model	Emission Frequency (GHz)	Level	Emission Frequency (uV/M)	Emission 15.109(a) by: Band (GHz)	Exceeds
5.	Uniden	11.32		188,365	11.07 - 12.13	51.5 dB
"	LRD 737	11.73		127,350	48.1 dB	
6.	Bel-Tronics	14.39		147,911	14.35 - 15.52	49.4 dB
"	Bel 950	15.00		177,828		51.0 dB
7.	Whistler	11.49		162,181	11.44 - 11.81	50.2 dB
"	1650	11.77		158,489		50.0 dB

It should be noted that of all seven units which we tested, only sample #6 has L.O. emissions which do not fall within the 11.7 - 12.2 GHz VSAT frequency band. This model would therefore would not appear to serve as an interference source to VSAT terminals. Its effects, if any, on occupants of 14.35 - 15.52 GHz spectrum is unknown.

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The Record of ET 01-278 Confirms Harmful Interference Caused By Radar Detectors

- Comments and Replies of Hughes Network Systems
- Comments and Replies of the Satellite Industry Association
- Comments of Comsearch
- Comments and Replies of SES Americom, Inc.
- Comments of Panamsat Corporation
- Comments of Loral Skynet
- Comment of Chevron Products Company

ALL SERVICE PROVIDERS HAVE PUT IN THE RECORD TECHNICAL DATA CONSISTENT WITH SPACENET'S FINDINGS

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The FCC Has Many Tools To Best Serve the Public Interest

ENFORCEMENT = Expedited resolution of public interest harms caused by existing rule violations.

RULEMAKING = Prospective guidelines of broad applicability to further public interest objectives.

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ENFORCEMENT

AT A MINIMUM, RADAR DETECTORS ARE KNOWN SOURCES OF HARMFUL INTERFERENCE TO LICENSEES, AND MUST CEASE OPERATIONS

- **Apart from violation of Section 15.5, further investigation is likely to demonstrate violations of Section 15.13 (failure to employ good engineering practices in manufacture) and Section 15.15 (failure to design/manufacture using minimum field strength necessary to attenuate interference).**
- **Radar detector manufacturers contend that eliminating interference to licensed VSATs would require costly equipment redesign. Yet, the manufacturers have, during this time period, given priority to enhancing detection of police radar while making it more difficult for police to detect presence of radar.**
- **To accomplish their goal, swept frequency oscillators that scan the entire down link, Ku band are a common design feature of radar detectors, causing high levels of harmful interference to Ku Band licensees.**

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ENFORCEMENT

CONGRESS GAVE THE COMMISSION BROAD AUTHORITY TO PROCEED AGAINST MANUFACTURERS AND DISTRIBUTORS OF UNLICENSED DEVICES CAUSING HARMFUL INTERFERENCE.

- **Intention to protect consumers from manufacturers of devices that do not meet standards set by Commission Rules governing unlicensed uses of spectrum. (Communications Amendments Act of 1982, Conference Report No. 97-765)**
- **The FCC routinely invokes its jurisdiction under Section 302 of the Act for these purposes.**

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Prompt Enforcement Is Needed to Avoid Results that Contradict the Act and Rules

- Resolving present interference in the context of the rulemaking produces unlawful result of licensee forced to accept harmful interference from unlicensed users for years to come.
- During that time, embedded consumer use grows, making any resolution that much more difficult to implement, and causing increasing damage to customers of critical VSAT services.
- Commenters support expedited enforcement action to resolve present interference (e.g., Hughes, Satellite Industry Association)